

Human Development

Chapter 7 – Early Childhood: Physical, Cognitive, & Language Development

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Children 2-6 yr. display cognitive & social egocentrism (e.g. “And the only reason for making honey is so I can eat it.” Pooh)

Reasoning changes from simple concepts to beginnings of logic.

Children begin early childhood with 2 or 3 word sentences using limited grammar. By 6 yr. they use complete sentences with mostly correct grammar.

They learn syntax, vocabulary, and also social norms such as politeness, obedience, gender roles.

Rapid physical changes, smaller relative head size longer limbs, dress themselves, write letters, place puzzle pieces.

Development in thinking, language, motor skills are interrelated. Mobility leads to exploration to learning to skills etc. as a dynamic system.

Physical Development

Body loses look of infancy in size and proportion. Rapid brain development leads to sophisticated and complex learning abilities and better gross & fine motor skills.

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Body Size and Proportion

Generalizations about growth may not apply to individual child. Malnutrition is a complex interplay of physical and behavioral interactions that affect physical cognitive and social development.

Body proportions change dramatically. At birth, head size is $\frac{1}{4}$ of overall length. At 16, head doubles in size but $\frac{1}{8}$ overall length.

Growth slows to $4\frac{1}{2}$ lb. and 3” per year but large variations.

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Center of gravity is higher in young children making them top-heavy and clumsy. Difficulty in stopping fast, catching ball without falling over.

Bones harden (*ossification*) – cartilage turns to bone – Skeletal age determined by x-ray. Can vary 2 yr. either way from chronological age.

Brain Development

By 5 yr. brain is nearly size of an adult. Brain development makes possible complex learning, problem solving, & language. Sensory-perceptual & motor activity, create & strengthen neural connections.

Neurons – 100 to 200 billion specialized cells make up nervous system.

Glial cells – insulates cells and improve efficiency of transmission of neural impulses. Continue to grow through year 2.

Brain growth spurt from 2 yr. to 6 yr. then continues at slower rate.

Plasticity allows children to better recover from brain injuries than later in life.

Neurons mature forming Myelin sheaths to insulate and protect neurons.

Myelination – the formation of sheathing cells that increase efficiency of transmission. Begins in early infancy for motor reflexes and vision. Followed by complex motor activity, eye-hand coordination, attention span, memory & self-control.

Specialization occurs as some neuron synapses increase and others are pruned.

Brain development pushes cognitive development which drives language development.

Alison Gopnik – Newborn synapses average 2,500 and increases to about 15,000 by 2-3 yr. then decreases as more are lost than new ones are formed.

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Between ages 10 to puberty, brain ruthlessly destroys weakest connections, preserving only the useful ones.

Theorists conclude that necessary interventions should start as early as possible. Head-start programs should start in the “window of opportunity.”

Cerebral cortex (Latin for “bark”) divided into two hemispheres.

Lateralization – the specialization of hemispheres in processing information and controlling behavior.

Corpus callosum – connective tissue between brain hemispheres. Severing can reduce seizures. Now seizure related surgery is more specific and refined.

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Left/right crossover control of body.

Other aspects of L/R brain bias.

Left Hemisphere Functions

- Right hand touch
- Speech
- Language
- Writing
- Logic
- Science
- Math

Right Hemisphere Functions

- Left-hand touch
- Spatial construction
- Creative thinking
- Fantasy
- Music appreciation
- Art appreciation

10% of people are left-handed, are more ambidextrous (Why not ambisinisterous?) Language tends to be more bilateral in L/H people.

L/H people may have less specialization/lateralization in general.

Young can learn to use non-dominant hand. That flexibility decreases with age. Handedness is established in early childhood.

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Motor Skills Development

Motor skills development improves dramatically in childhood. Gross motor skills more dramatic than fine motor skills.

Distinguishing between perceptual-motor development and general cognition is difficult.

Functional subordination – actions initially preformed for their own sake that later become integrated into more complex, purposeful functions.

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Gross Motor Skills

At 2 yr. children can walk and run but walk with wade stance and a swaying gate. They use both hands when only one is necessary.

Gross motor skills become automaticized (run, hop, throw)

By 3 yr. legs are closer together, perform motor behavior without consciously thinking about them (*automaticity*)

By 4 yr. can vary the rhythm of running, can skip awkwardly, running or standing jump.

By 5yr. can skip smoothly, walk a balance beam, stand on one foot, dance steps

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Fine Motor Skills

Coordinated and dexterous use of hand, fingers and thumb

2-3 yr. can put on and remove simple items of clothing.

4-5 yr. can dress/undress themselves.

6 yr. can tie simple knots, use utensils, etc. . (ex. Zippers, buttons, shoes, feed self)

Get rid of Velcro by 5 yr.

Fine motor skills develop more slowly due to immature nervous system.

Learning and Motor Skills

Important conditions for motor skill learning include *readiness, practice, attention, competence motivation, & feedback*.

If children are introduced to tasks at optimal *readiness*, they learn quickly with little effort. They give clues when at optimal readiness.

Practice is essential to motor development. Restricted environments retard motor skills development.

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Attention requires an alert & engaged state of mind.

3 yr. need to be lead through activities to focus attention.

3-5 yr. can focus attention through active imitation.

6-7 yr. can attend to verbal instructions.

Competence motivation – doing things just to see if you can.

Intrinsically motivated behavior – performed for its own sake with no particular goal.

Extrinsically motivated behavior – performed to gain rewards or avoid adverse events.

Feedback – helps acquire and refine motor skills.

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Cognitive Development

It is difficult to distinguish between developing physical development and cognitive development.

Preoperational Thinking

Children at this stage continue to explore the world using their developing language & problem solving skills. They do not yet have concepts like *cause and effect, most concepts of numbers, perceptions of reality, time and space*.

Preoperational period last from 2 to about 7.

It is divided into 2 sub stages;

preconceptual period (2 to about 4) increased use of symbols and symbolic (pretend) play. Thinking is more flexible. Words can be used for objects in their absence.

Their thinking displays *animism*. (eg. Things that move are alive.) And they display *reification* (Objects and people in their thoughts are real to them.)

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Egocentrism – tendency to see and understand things in terms of a personal point of view.

Intuitive or transitional period (about 5 to 7) begins to separate mental from physical and to understand causation. Begin to understand multiple points of view and causality. Begin to understand that objects and people are permanent and can not transform as in magic but will change their mind if a fairy tail is told as “true”.

Symbolic Representation

Symbolic Representation is the most dramatic difference between infants & 2 yr. Uses actions, images & words to represent objects and events; numbers to represent quantity; act out stories.

Symbolic Representation begins at the end of sensory-motor period but evolves in the preoperational stage. 2½ yr. need realistic props for games. 3 yr. do not.

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Children show understanding of similarities between two objects by giving objects same name.

Separation of self from others may lead to sensitivity to others which may reduce egocentrism.

Limitations on Preoperational Thinking

Limitations include *concreteness, irreversibility, egocentrism, centration, time, space and sequence*.

Concreteness – can’t deal with abstracts. Concerned with here and now, physical things that can easily be represented.

Irreversibility – events and relationships are in one direction only.

Egocentrism – difficulty in taking another’s view.

Centration – ability to focus on only one aspect of an object (e.g. Are there more red beads or more wooden beads.)

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Time, space and sequence – 2-3 yr. use words indicating time and space but may not know what they really mean. They have difficulty with cause-and-effect. (e.g. How long is a week? What is the past? How far is a block?)

Spatial relations develop in early childhood. In, out, near, far, etc. learned through experience with own body

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Preconceptual Period

Animism – things that move are alive.

Reification – objects/people in dreams are real.

Egocentrism – see/understand from own POV.

Intuitive Period

Symbolic representation – actions images, words represent things and events.

Sociocentric thinking – begins to understand other’s POV.

Limitations of Preoperational Thinking

Concreteness – no abstractions.

Irreversibility – actions/relationships in one direction only.

Centration – focus on one aspect of a problem at a time.

Conservation

Conservation – changing the shape/appearance does not change mass, number, volume, etc. Preoperational children deal only with here-and-now. Centration and irreversibility get in the way of conservation.

Limitations of Piaget's Theories

Challenges have been made to Piaget's view on conservation, centration, and egocentrism.

Number-abstraction abilities – counting using numbers to represent objects.
Numerical-reasoning abilities – the way objects can be transformed numerically.

Beyond Piaget: Social Perspectives

Where Piaget viewed the child as the “lone explorer,” others take a more “social” view. They learn from parents, other children, etc.

Katherine Nelson – knowledge of and participation of routine daily activities – knowledge of world is embedded in cultural knowledge.

Vygotsky's zone of proximal development – participation in activities beyond present abilities assists advanced levels of social and cognitive skills.

Memory and Cognitive Development

Memory is central to cognitive development

Memory Process

Sensory register in the visual system retains information very briefly (often much less than one second) before it is replaced or passed on for processing. Auditory *sensory register* lasts up to 3 seconds.

Short-term memory (STM)/working memory – is the next step for processing. It is consciousness – what you are thinking about at a given moment.

Rehearsal – the process, during the 15 to 30 second STM window, necessary to move information to *long-term memory (LTM)*.

Long-term memory (LTM) – permanent, based on structural changes in the brain – new synapses. Can consist of images actions and words. Are known as visual, motor, verbal (semantic) memory.

Visual memory is first to develop but most people can't remember before 3 yr. Probably due to encoding but unsure of process involved. Verbal memories appear at 4-6 yr.

Recognition and Recall

Recognition – ability identify items when they appear again.

Recall – ability to retrieve information without cues.

Young children perform well on recognition – poorly on recall. Recall in young can increase with training. For 2-5 yr., both forms of remembering improve naturally.

Rehearsal and Organization

Generally assumed that <2 yr. recall difficulties related to limited strategies in encoding & retrieval, attention span & working memory. Adults devise methods like classification that children do not. Young children do devise some strategies.

Teaching strategies for remembering works temporarily but becomes boring or is forgotten. Normal play activities worked better than formal strategies in young children.

Event Scripts and Sequential Understanding

Young children capable of remembering time sequenced step-by-step information such as how to make objects from clay.

Young children are aware of occasions as being comprised of an orderly progression of events. It is only later that they can reverse the order however.

Language, Development & Culture

Children rapidly expand their vocabulary (grammar, words, and concepts).

An Expanding Grammar

Mean length of utterance (MLU) – the average length of the sentences that a child produces.

Roger Brown identified 5 increasingly complex stages of language acquisition.

Stage 1 – characterized by two word utterances or telegraphic speech, pivot and open words. Convey concepts as that objects exist, they appear and recur and people possess them.

Stage 2 – slightly longer than two words. They begin to use generalized rules of inflection. Tendency to over-regularize inflections. (goed to the store, broke the glass)

Stage 3 – modify simple sentences, create negative & imperative forms, ask yes/no questions. But they still have trouble with passive voice. Difference between “helped” and “is helped by” children find difficult.

Stages 4 & 5 – increasingly sophisticated language, use of subordinate clauses, fragments and complex sentences. By 4½ yr. they have a good grasp of correct syntax.

More Word and Concepts

They learn rapidly (2-3 words per day). They may learn one side of a relation “more” and not the other side “less”. If they don't know a word they may substitute a noun “Mommy, pencil it.” instead of “Mommy, write it.”

Through age 3, they still have trouble with pronouns. (Us vs. We) These errors can persist through 4-5 yr.

The Influence of Parents' Language

Cultures transmit language to its children. Caregivers ask questions to check understanding, expand children's utterances, play ritualized word games.

Twins often display delayed language development. This may be genetic or due to sharing of the mother's available time.

Parent's speech to children conveys how thoughts are expressed, and ideas exchanged, teach about categories and symbols, how to translate complexities into words, scaffolds for understanding the world.

Language and Gender

Children use language to learn who they are and how to relate to others. Adults convey gender expectations through language but also gender biased toys affect how much and what kind of language is used.

Private speech – talking to yourself.

Children's Conversations

Children have conversations with adults, children and themselves that typically follow certain patterns.

Monitoring the Message

Children learn that conversations start with getting the other person attention, they have to take turns. They have a beginning middle and end, they should stay on one subject and make non-verbal sounds or gestures to indicate understanding.

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Young children often have collective monologues. Later talk about same thing. Stop to see if they are understood, repeat and correct.

Later they adjust conversation to reduce friction, conflict and embarrassment. They also learn *pragmatics* – the social and cultural aspects of language.

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Subdialects

Dialects – are language variations that can not usually be understood by all speakers of the language.

Subdialects – are variations within a language that all speakers can usually understand.

Bilingualism

Language is also a symbol of group identity, which conveys attitudes, values and contributes to socialization.

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Children who learn two languages in infancy show little confusion over the rules of the two languages.

They may use two separate language systems or a hybrid system that they later separate.

Play and Learning

Development during childhood is enhanced through play and occurs in all cultures.

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Play satisfies need for stimulation and diversion. To express exuberance, experience change, satisfy curiosity, to explore, and experiment in a risk free environment.

Kinds of Play

Promotes cognitive development.

Preoperational children use play to learn about physical environment

Dramatic play helps master symbolic representation and increase social knowledge.

Sensory Pleasure

The aim is sensory experience in and of itself.

Endless play of splash water, chew grass, bang pots, pluck flower petals are simply to experience sounds, tastes, odors, and textures.

Teaches facts about their bodies and the environment.

Play with Motion

Motion is enjoyed for its own sake.

Rocking, blow bubbles running around in circles teach balance coordination. It is also a vehicle for social experiences.

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Rough-and –Tumble Play

May reduce tension and real fighting. Provides benefits if limited. May help children manage and control emotions within socially acceptable levels.

Play with Language

Children play with language to experiment with rhythm & cadence, poke fun at the world, verify their grasp of reality, buffer against aggression.

Language play helps them master grammar and word use. At 3-4 yr. they are using basic linguistic rules and structures of meanings.

They use language to create highly structured rituals in their play.

Dramatic Play and Modeling

With dramatic play, children learn about social relationships, rules and culture through fantasy and imitation of whole patterns. It also interacts with beginnings of literacy.

Games, Rituals, and Competitive Play

Play develops rules and specific goals; learn about winning and losing using rules & rituals, cause & effect, and consequences.

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Play and Cognitive Development

Preoperational children use play to learn about physical surroundings, master symbolic representation, and social knowledge.

Exploring Physical Objects

They learn about properties and physical laws governing objects.

They learn how to compare and classify objects and develop skills leading to self confidence and security.

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Play and Egocentrism

At 2 yr. interaction begins with interest in toy the other child is playing with, not the other child. They will play separately side-by-side.

At 3yr. dramatic play shows more maturity – roles won't work without interaction.

4yr. children show deference in interacting with 2y. and with older children.

Dramatic Play and Social Knowledge

Role play gives better understanding of others and self. They experience reactions of others to their behaviors, consequences of actions, experience intense feelings, resolve conflicts and feelings.

The Role of Peers

Mixed age peer groups offer opportunity to practice teaching and care for younger children.

May encourage development of problem solving.